

### **REMARKS/ARGUMENTS**

Claims 1-23 are pending in this application. By this amendment the second set of claims 20, 21 and 22 are renumbered 21, 22 and 23, respectively, to correct an error in numbering. No new matter has been added.

The following remarks are believed to be fully responsive to the Office Action. All the pending claims at issue are believed to be patentable over the cited references. Reconsideration and withdrawal of the outstanding rejections are respectfully requested in view of the following remarks.

### **Drawings**

Applicants have amended FIG. 1 in view of the Examiner's comments. The attached sheet of drawings includes the change to FIG. 1 to reflect "Related Art" as per M.P.E.P. §608.02(g). Accordingly, Applicants respectfully request that the amendment be entered.

### **Claim Rejections Under 35 U.S.C. §103(a)**

Examiner rejected claims 1-23 under 35 U.S.C. §103(a) as being obvious. This rejection is respectfully traversed.

Applicants' independent claim 1 recites, "a broadband coaxial transmission line, comprising: joined segments of coaxial transmission lines, the segments being of substantially the same length; and a plurality of substantially identical first and second insulating supports, wherein the first insulating supports are positioned at flange joints within the joined segments and the second insulating supports are positioned within the joined segments at equidistant

intervals from each other and equidistant from the first insulating supports, the distance between any of the insulating supports being approximately one half a wavelength of a frequency that is outside a channel band of an operating range of the transmission line.”

Applicants’ independent claim 9 recites, “a method for designing a broadband coaxial transmission line, comprising the steps of: joining segments of substantially identical transmission lines of substantially identical lengths; arranging a plurality of insulating supports within the joined segments, so that the insulating supports are substantially equidistant from each other and the distance between any of the insulating supports is approximately one half a wavelength of a frequency that is outside a channel band of an operating range of the transmission line.”

Applicants’ independent claim 17 recites, “a broadband coaxial transmission line, comprising: joined segments of substantially equal length electrical signal transmitting means for transmitting a signal from a source to a load; and a plurality of substantially identical supporting means for separating an inner conductor of the transmitting means from an outer conductor of the transmitting means, the supporting means positioned in the electrical signal means at substantially equidistant intervals, wherein the substantially equidistant intervals correspond to approximately one half a wavelength of a frequency that is outside a channel band of an operating range of the electrical signal transmitting means.”

The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. *MPEP*§2142. To establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation to modify the references or to combine reference teachings. Second, there must be reasonable expectation of success. Finally, the prior art must teach all the claim limitations. *MPEP*§2142. In light of the following

arguments, the combined references do not teach or suggest all of the claim limitations of the present invention.

Applicants respectfully point to the final prong of the test which states that the prior art must teach all of the claim limitations. At the very least, the combined references do not teach or suggest all of the limitations of claims 1, 9 and 17, as stated below.

The Examiner rejected claims 1-23 under 35 U.S. C. §103(a) as being unpatentable over the admitted prior art (APA) in view of U.S. Patent No. 4,799,036 to Owens. The admitted prior art includes U.S. Patent No. 6,816,040 to Brown, *et al.*, U.S. Patent No. 3,364,489 to Masters, U.S. Patent No. 2,654,868 to Zaleski, U.S. Patent No. 2,588,103 to Fox, U.S. Patent No. 2,445,348 to Ford, and to U.S. Patent No. 2,419,985 to Brown.

The '040 patent to Brown, *et al.*, discloses a broadband coaxial transmission line formed by joining smaller coaxial transmission lines having particularly formulated lengths. Supports in the transmission line are situated in a particular manner to reduce reflections along the transmission line. The '489 patent to Masters discloses a traveling wave antenna in which electromagnetic waves are propagated along a transmission channel for absorption of energy therefrom and consequent radiation of the electromagnetic wave by a plurality of pairs of the recurrent radiating elements coupled to the channel for cophasal excitation by each electromagnetic wave. The '868 patent to Zaleski discloses microwave hollow guide rotatable joints which provide angularly variable connections between hollow guides of rectangular or circular cross section. The '103 patent to Fox discloses frequency selective wave transmission systems employing wave guide transformers. The '348 patent to Ford discloses microwave transmission and measurement systems and aperiodic reflectometers for measuring the magnitude of reflected waves over a wide frequency range on a wave-guide transmission system. The '985 patent to Brown discloses reactance compensation and neutralizing the effects of the reactances which are unavoidably present in radio frequency power circuits. Thus, the APA is

directed to minimizing in-band reflections by varying the spacing according to particular algorithms.

The Examiner states that the APA discloses a broadband coaxial transmission line advocated by joining several smaller coaxial transmission lines together at flange points where a series of insulating supports are interspersed within the line but does not disclose basic intervals of approximately one half-wavelength. The Examiner states that Owens teaches the use of effective half wavelength structures to eliminate reflections and that it would have been obvious to one of ordinary skill in the art to apply the half wavelength teachings of Owens to APA's transmission lines studying the spacing between the APA insulating supports to approximately half a wavelength. Applicants respectfully disagree.

Specifically, the '036 patent to Owens is directed to a coaxial transmission line vacuum feed-through based on the use of a half-wavelength annular dielectric pressure barrier disc or multiple discs comprising an effective half-wavelength structure to eliminate reflections from the barrier surfaces. (Abstract). Owens teaches an in-band solution to eliminate reflections from a single localized area. (Column 2, lines 60-68). If the reflections are completely eliminated, then many can be cascaded together without VSWR build up. However, this is not practical for transmission line use since literally thousands of insulators are necessary to support the inner conductor and the reflections from each can never be completely eliminated. Thus, Owens takes a similar approach as the APA, in that Owens is also directed to minimizing in-band reflections, however Owens uses  $\frac{1}{2}$  wavelength between the spacers to do so. (Column 5, lines 42-46).

In contrast, the presently claimed invention provides for, "the distance between any of the insulating supports... that is outside a channel band of an operating range of transmission line,"

as recited in claim 1 and similarly in claims 9 and 17. (Emphasis added). Thus, notwithstanding Owens' use of  $\frac{1}{2}$  wavelength spacing, the spacings are respective to an in-band frequency of the transmission line and not to an, "outside a channel band of an operating range of transmission line," as claimed. Accordingly, Owens does not supply the subject matter lacking in the APA.

In accordance with the M.P.E.P. §2143.03, to establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re: Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re: Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494 196 (CCPA 1970).

Since, each and every element of the present invention is not taught by the APA, alone or in combination with Owens, the references can not teach or suggest the present invention as recited in Applicants' independent claims 1, 9 and 17. Claims 2-8 depend from independent claim 1; claims 10-16 depend from independent claim 9; and claims 18-23 depend from independent claim 17. Therefore, for at least the above reasons, Applicants respectfully request the withdrawal of this rejection.

Docket No. 87326.3940  
Application No. 10/625,551  
Customer No. 30734

Patent

### CONCLUSION

In view of the foregoing remarks, Applicants respectfully submits that this application is in condition for allowance. Should the Examiner believe that anything further is necessary to place the application in even better condition for allowance, the Examiner is invited to contact the undersigned attorney at 202-861-1746 in an effort to resolve any matter still outstanding before issuing another action.

In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 50-2036 with reference to our Docket No. 87326.3940.

Respectfully submitted,

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Patent

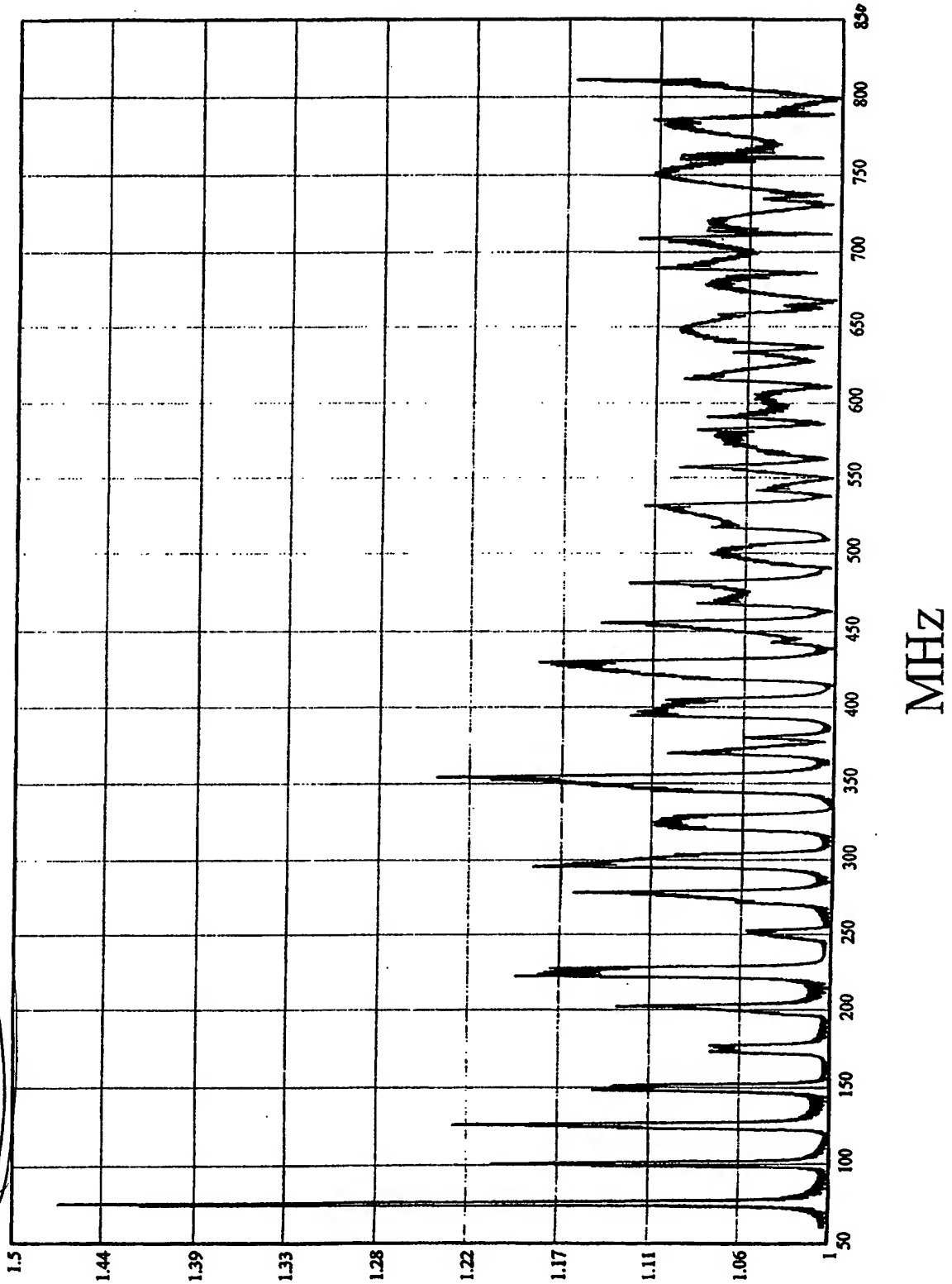
**Amendments to the Drawings:**

In light of this amendment, Applicants respectfully requests that the amendment to drawings being entered and the objection to the drawings be withdrawn.

Attachment: Replacement Sheet  
Annotated Drawing Sheet

FIG. 1

Related Art



11

